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COVER SHEET FOR TECHNICAL MEMORANDUM

TITLE- Relating the LM Descent Redesignation
ΔV Budget to the Landing Ellipse
Evaluation Number "N"

TM-69-2015-6

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Case 340

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ABSTRACT

The following LM descent redesignation strategy for avoiding craters is investigated. Whenever the Landing Point Designator (LPD) indicates that the landing point lies within a crater, redesignation is made to a nearby improved region where the largest crater is, at most, some fraction β of the crater being avoided. In order to allow for LPD errors, the time of redesignation is delayed until the crater diameter equals that of the LPD error circle. Both the case where the predicted landing point lies within the crater, as well as the case where the predicted point is as much as 50% of the crater diameter outside of the rim, are studied.

The probability analysis gives the number of redesignations and the corresponding ΔV required, as a function of the site improvement factor β and the site evaluation number N. The analysis takes into account the fact that after each redesignation, a new N number is computed whose larger value reflects the smoother topography of the area to which the spacecraft has been redirected.

The numerical results indicate that the site improvement factor β is of less importance than the landing ellipse evaluation number N. For the Apollo 11 landing site the number of redesignations is less than 2.6 with 99.75% probability and the expected total ΔV is less than 15 meter/sec. This strategy of crater avoidance is more efficient than the random redesignation process.

(NASA-CR-107916) RELATING THE LM DESCENT
REDESIGNATION DELTA 5 BUDGET TO THE LANDING
ELLIPSE EVALUATION NUMBER N (Bellcomm, Inc.)

N79-71965

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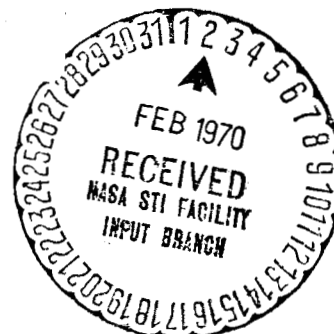
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